

A NEW TETRAPLOID SUBSPECIES OF LASTHENIA
(COMPOSITAE) FROM OREGON

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The single perennial species of *Lasthenia* (Compositae: Helenieae) is the variable, rather local *L. macrantha* (Gray) Greene of California and southwestern Oregon. Recently I have recognized two subspecies of *L. macrantha*: ssp. *bakeri* (J. T. Howell) Ornduff, restricted to the closed-cone pinelands of California, and ssp. *macrantha*, which ranges along exposed areas of the immediate coast from Curry Co., Oregon, southward to San Luis Obispo Co., California (Ornduff, 1966). The Oregon populations of this species (previously referred to ssp. *macrantha*) are tetraploid ($n = 16$) and the California populations are hexaploid ($n = 24$). I have stated without further explanation that "In cultivation these tetraploid races are easily separable from the hexaploids on the basis of head size and growth habit, but these differences are not always evident in wild plants" (Ornduff, 1966, p. 22).

Cultivated plants of the tetraploids tend to be lower and have smaller heads and leaves than the hexaploids. The tetraploids also form small dense mats by means of rhizomatous growth, whereas the hexaploids generally do not. In addition, flowering of tetraploids occurs only in the summer, whereas the hexaploids tend to be less seasonal in their flowering behavior. However, the phenotypic plasticity of wild plants (particularly of the hexaploids) in response to variations in edaphic, seasonal, or other local conditions is great. When this plasticity is superimposed upon the considerable interpopulation genetic variability of both the tetraploids and hexaploids, any taxonomic separation of these two chromosomal entities seemed impractical despite the striking differences between them in cultivation. Subsequent morphological studies of herbarium specimens collected from wild populations in California and Oregon have provided a number of fairly reliable characteristics by which field-collected plants of the tetraploids can be distinguished from the hexaploids. As a consequence, I am now giving the tetraploids sub-specific recognition.

LASTHENIA MACRANTHA (Gray) Greene ssp. **prisca** Ornduff ssp. nov. Type. "Very abundant on Cape Blanco, Curry Co., Ore.," *L. F. Henderson 11400 ORE*, PH, UC 446955-holotype), July 16, 1929.

Phyllaria corollae que radii ligulatae 11 vel pauciores; corollae radii lignulatae circa 7.5 mm longae; pedunculi circa 5-6 cm longi; par primum foliorum infra capitulum utrumque circa 1.3 cm longum, plerumque minor quam 3 mm latum; internodium primum infra par primum foliorum circa 2.0 cm longum; par secundum foliorum infra capitulum circa 1.8 cm longum; folia longissima plantae circa 2.4 cm longa; chromosomatum numerus $n = 16$.

TABLE 1. MORPHOLOGICAL FEATURES DISTINGUISHING *L. MACRANTHA* SSP. *MACRANTHA* AND SSP. *PRISCA*. RANGE AND SAMPLE SIZE ARE GIVEN IN PARENTHESES

Mean Measurement	ssp. <i>prisca</i>	ssp. <i>macrantha</i>
Number of phyllaries	10.7 (8-14; 10)	11.8 (9-16; 25)
Length of ray floret ligule	7.5 mm (5-9; 14)	10.3 mm (6-18; 28)
Number of ray florets	10.9 (8-15; 13)	11.8 (9-15; 28)
Length of peduncle above first pair of leaves	5.2 cm (2.0-8.0; 12)	8.5 cm (2.6-14.5; 23)
Length of leaf in first pair of leaves below head	1.3 cm (0.9-1.9; 12)	2.6 cm (1.4-2.7; 25)
Width of first pair of leaves below head	2.3 mm (1.8-3.0; 13)	2.8 mm (1.5-5.5; 23)
Internode length between first and second pair of leaves below head	2.0 cm (0.2-3.5; 13)	2.6 cm (1.0-6.5; 22)
Length of leaf of second pair of leaves below head	1.8 cm (0.8-3.3; 13)	3.2 cm (1.3-6.4; 18)
Length of longest foliage leaf	2.4 cm (2.0-4.0; 12)	5.6 cm (2.8-8.8; 25)

Phyllaries and ray florets usually 11 or fewer; ligules of ray florets averaging 7.5 mm long; peduncles averaging 5-6 cm long; first pair of leaves below capitulum each averaging 1.3 cm long and mostly less than 3 mm wide; first internode below first pair of leaves averaging 2.0 cm long; second pair of leaves below capitulum averaging 1.8 cm long; longest leaves averaging 2.4 cm long; $n = 16$.

Representative specimens (all Curry Co., Oregon): Cape Blanco, *J. W. Thompson 12546* (CAS, NY, UC, US), *N. P. Gale 355* (GH), *Ornduff 4985* (UC); Cape San Sebastian, *Ornduff 4986* (JEPS, UC); Bluffs north of mouth of Rogue river, *Ornduff 6981* (JEPS, UC); about 7 miles south of Ophir, *Bacigalupi & Heckard 8975* (JEPS); near mouth of Sixes River, *Peck 8542* (DS, F, GH, NY); bluffs along beach at Arch Rocks, *J. W. Thompson 12834* (CAS, NY, PH, WSU).

Measurements were made of 26 vegetative and floral characteristics of the specimens in eight field collections of hexaploid *L. macrantha* ssp. *macrantha* from throughout its range and including small specimens that superficially resembled the tetraploids. Four field collections of *L. macrantha* ssp. *prisca* from Oregon were examined. The nine characters that were most useful for distinguishing these two subspecies are given in Table 1. There was overlap in all of these measurements, but the averages of these 9 characteristics are different and most of the measurements for each subspecies are exclusive. Thus, without knowing the geographical origin of specimens, it is possible to separate the two subspecies with a high degree of accuracy.

Interspecific hybrids have been made in addition to those reported upon previously (Ornduff, 1966, pp. 25-27; new data in table 2) and

TABLE 2. POLLEN VIABILITY OF INTER- AND INTRASUBSPECIFIC HYBRID PROGENIES OF *LASTHENIA MACRANTHA* SSP. *PRISCA* (SEE ALSO ORNDUFF, 1966, 6. 27)

Cross (hexaploid × tetraploid)	Number of hybrids grown	Average pollen viability (range)
5059 ¹ × 4986 ²	4	78 (44-93)
Reciprocal	2	80 (77,82)
5059 × 6981	1	91
4709 ³ × 4986	7	50 (15-93)
Reciprocal	6	77 (50-98)
4709 × 6981	7	50 (0-87)
Reciprocal	2	93 (-)
(tetraploid × tetraploid)		
4985 × 6981	7	93 (75-98)
Reciprocal	6	93 (89-97)
4985 × 4986	6	88 (72-96)
Reciprocal	6	94 (89-99)
6981 × 4986	6	93 (83-98)
Reciprocal	5	88 (84-92)

¹ Field number of author; ssp. *macrantha*, Noyo River, Mendocino Co., Calif.
² Field localities for ssp. *prisca* are listed in text.
³ ssp. *bakeri*, Garcia River, Mendocino Co., Calif.

intrasubspecific hybrids have been made in *L. macrantha* ssp. *prisca* as well (table 2). Despite the low crossability between the tetraploids and hexaploids, their hybrids tend to produce pollen with a moderate to high viability (based on the staining reaction of 100 pollen grains mounted in aniline blue-lactophenol). It should also be pointed out that hybrids between *L. macrantha* ssp. *prisca* and tetraploid plants of the allopatric closely related annual *L. chrysostoma* also are generally fertile (Ornduff, 1966, p. 28). In many respects, *L. chrysostoma* may be viewed on an annual "version" of *L. macrantha*.

Lasthenia macrantha ssp. *prisca* is known from a very few populations that occur along the southern Oregon coast. Some of these populations, such as those at Cape Sebastian, are very small and in other areas real estate developments or grazing activities risk exterminating the subspecies locally.

The tetraploid chromosome number of *Lasthenia macrantha* ssp. *prisca* suggests that it is ancestral to the hexaploid subspecies of *L. macrantha*. The epithet *prisca*, which means "belonging to former times, ancient, primitive," is intended to reflect this relationship as well as the relic nature of this tenuously surviving subspecies.

LITERATURE CITED

- ORNDUFF, R. 1966. A biosystematic survey of the goldfield genus *Lasthenia* (Compositae: Helenieae). Univ. Calif. Publ. Bot. 40:1-92.